```
? E AU=KARAOLIS, DAVID

Ref    Items  Index-term
E1         1  AU=KARAOLIS, D.K.R
E2         1  AU=KARAOLIS, D.K.R.
E3         2 *AU=KARAOLIS, DAVID
E4         4  AU=KARAOLIS, DAVID K. R
E5        34  AU=KARAOLIS, DAVID K. R.
E6         2  AU=KARAOLIS, DAVID K.R.
E7        10  AU=KARAOLIS, DAVID KR
E8         2  AU=KARAOLIS, DK
E9         8  AU=KARAOLIS, DK*
E10       16  AU=KARAOLIS, DKR
E11        6  AU=KARAOLIS, DKR*
E12        1  AU=KARAOLIS, E

          Enter P or PAGE for more
? S E1-E12
                1  AU=KARAOLIS, D.K.R
                1  AU=KARAOLIS, D.K.R.
                2  AU=KARAOLIS, DAVID
                4  AU=KARAOLIS, DAVID K. R
               34  AU=KARAOLIS, DAVID K. R.
                2  AU=KARAOLIS, DAVID K.R.
               10  AU=KARAOLIS, DAVID KR
                2  AU=KARAOLIS, DK
                8  AU=KARAOLIS, DK*
               16  AU=KARAOLIS, DKR
                6  AU=KARAOLIS, DKR*
                1  AU=KARAOLIS, E
     S12       86  E1-E12
? S S12 AND CELLULASE
               86  S12
           105040  CELLULASE
     S13        0  S12 AND CELLULASE
? S S12 AND GLUCANASE
               86  S12
            41245  GLUCANASE
     S14        0  S12 AND GLUCANASE
? S S12 AND BACILLUS
               86  S12
           789444  BACILLUS
     S15        0  S12 AND BACILLUS
? S CYCLIC(W)DINUCLEOTIDE OR (C-DI-GMP)
          1993379  CYCLIC
           246041  DINUCLEOTIDE
              365  CYCLIC(W)DINUCLEOTIDE
              198  C-DI-GMP
     S16      547  CYCLIC(W)DINUCLEOTIDE OR (C-DI-GMP)
? S S16 AND (STAPHYLCCCCCUS)
              547  S16
           863036  STAPHYLCCCCCUS
     S17       53  S16 AND (STAPHYLCCCCCUS)
? RD

>>>Duplicate detection is not supported for File 393.

>>>Duplicate detection is not supported for File 391.

>>>Records from unsupported files will be retained in the RD set.
     S18       25  RD (unique items)
? T S18/3,K/1-25
>>>KWIC option is not available in file(s): 399
```

18/3,K/1 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2010 The Thomson Corporation. All rts. reserv.

0020850034 BIOSIS NO.: 200900190368
A Putative c-di-GMP Signaling Pathway Regulates Biofilm Formation in Staphylococcus aureus
AUTHOR: Opperman T J (Reprint); Kwasny S M; Brothers K M; O'Toole G A; Moir D T
AUTHOR ADDRESS: Microbiotix Inc, Worcester, MA USA**USA
JOURNAL: Abstracts of the General Meeting of the American Society for Microbiology 108 p56 2008 2008
CONFERENCE/MEETING: 108th General Meeting of the American-Society-for-Microbiology Boston, MA, USA June 01 -05, 2008; 20080601
SPONSOR: Amer Soc Microbiol
ISSN: 1060-2011
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

A Putative c-di-GMP Signaling Pathway Regulates Biofilm Formation in Staphylococcus aureus
DESCRIPTORS:
...ORGANISMS: Staphylococcus aureus (Micrococcaceae)
CHEMICALS & BIOCHEMICALS: c-di-GMP...
GENE NAME: Staphylococcus aureus icaADBC gene (Micrococcaceae...

...Staphylococcus aureus MW0708 gene (Micrococcaceae...

...Staphylococcus aureus MW0014 gene (Micrococcaceae

18/3,K/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2010 The Thomson Corporation. All rts. reserv.

0019529601 BIOSIS NO.: 200700189342
Bacterial c-di-GMP is an immunostimulatory molecule
AUTHOR: Karaolis David K R (Reprint); Means Terry K; Yang De; Takahashi Munehisa; Yoshimura Teizo; Muraille Eric; Philpott Dana; Schroeder John T; Hyodo Mamoru; Hayakawa Yoshihiro; Talbot Brian G; Brouillette Eric; Malouin Francois
AUTHOR ADDRESS: Intragen Res Inst, 415 Oakington Rd, Havre De Grace, MD 21078 USA**USA
AUTHOR E-MAIL ADDRESS: dkaraolis@intragenics.org
JOURNAL: Journal of Immunology 178 (4): p2171-2181 FEB 15 2007 2007
ISSN: 0022-1767
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

...ABSTRACT: bacterial intracellular signaling molecule. We have shown that treatment with exogenous c-di-GMP inhibits Staphylococcus aureus infection in a mouse model. We now report that c-di-GMP is an...

DESCRIPTORS:
ORGANISMS: Staphylococcus aureus (Micrococcaceae...
CHEMICALS & BIOCHEMICALS: ...c-di-GMP

18/3,K/3 (Item 3 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
(c) 2010 The Thomson Corporation. All rts. reserv.

18506968 BIOSIS NO.: 200510201468
c-di-GMP as a novel anti-biofilm agent against Staphylococcus aureus.
AUTHOR: Karaolis D K R (Reprint); Rashid M H; Rajanna C; Buckles E; Luo W; Hyodo M; Hayakawa Y
JOURNAL: Abstracts of the Interscience Conference on Antimicrobial Agents and Chemotherapy 44 p203 OCT-NOV 2004 2004
CONFERENCE/MEETING: 44th Interscience Conference on Antimicrobial Agents and Chemotherapy Washington, DC, USA October 30 - November 02, 2004; 20041030
ISSN: 0733-6373
DOCUMENT TYPE: Meeting; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English

c-di-GMP as a novel anti-biofilm agent against Staphylococcus aureus.
DESCRIPTORS:
...ORGANISMS: Staphylococcus aureus (Micrococcaceae
DISEASES: methicillin-resistant Staphylococcus aureus infection { MRSA...
CHEMICALS & BIOCHEMICALS: ...c-di-GMP

18/3,K/4 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2010 The Thomson Corporation. All rts. reserv.

18463324 BIOSIS NO.: 200510157824
3',5'-cyclic diguanylic acid reduces the virulence of biofilm-forming Staphylococcus aureus strains in a mouse model of mastitis infection
AUTHOR: Brouillette Eric; Hyodo Mamoru; Hayakawa Yoshihiro; Karaolis David K R; Malouin Francois (Reprint)
AUTHOR ADDRESS: Univ Sherbrooke, Fac Sci, Dept Biol, CEVDM, 2500 Boul Univ, Sherbrooke, PQ J1K 2R1, Canada**Canada
AUTHOR E-MAIL ADDRESS: francois.malouin@usherbrooke.ca
JOURNAL: Antimicrobial Agents and Chemotherapy 49 (8): p3109-3113 AUG 2005 2005
ISSN: 0066-4804
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

3',5'-cyclic diguanylic acid reduces the virulence of biofilm-forming Staphylococcus aureus strains in a mouse model of mastitis infection

ABSTRACT: The cyclic dinucleotide 3',5'-cyclic diguanylic acid (c-di-GMP) is a naturally occurring small molecule that regulates important signaling systems in bacteria. We have recently shown that c-di-GMP inhibits Staphylococcus aureus biofilm formation in vitro and its adherence to HeLa cells. We now report that...

DESCRIPTORS:
...ORGANISMS: Staphylococcus aureus (Micrococcaceae
CHEMICALS & BIOCHEMICALS: cyclic dinucleotide 3',5'-cyclic diguanylic acid...

18/3,K/5 (Item 5 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

(c) 2010 The Thomson Corporation. All rts. reserv.

18316084 BIOSIS NO.: 200510010584
3',5'-Cyclic diguanylic acid (c-di-GMP) inhibits basal and growth factor-stimulated human colon cancer cell proliferation
AUTHOR: Karaolis David K R (Reprint); Cheng Kunrong; Lipsky Michael; Elnabawi Ahmed; Catalano Jennifer; Hyodo Mamoru; Hayakawa Yoshihiro; Raufman Jean-Pierre
AUTHOR ADDRESS: Univ Maryland, Sch Med, Dept Epidemiol and Prevent Med, Baltimore, MD 21201 USA**USA
AUTHOR E-MAIL ADDRESS: karaolis@umaryland.edu
JOURNAL: Biochemical and Biophysical Research Communications 329 (1): p 40-45 APR 1 05 2005
ISSN: 0006-291X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The novel cyclic dinucleotide, 3',5'-cyclic diguanylic acid, cGpGp (c-di-GMP), is a naturally occurring small molecule...

...GMP treatment might be a useful antimicrobial approach to attenuate the virulence and pathogenesis of Staphylococcus aureus and prevent or treat infection. In the present communication, we report that c-di...

DESCRIPTORS:
...ORGANISMS: Staphylococcus aureus (Micrococcaceae
CHEMICALS & BIOCHEMICALS:

18/3,K/6 (Item 6 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2010 The Thomson Corporation. All rts. reserv.

18261395 BIOSIS NO.: 200500168131
c-di-GMP (3'-5'-cyclic diguanylic acid) inhibits Staphylococcus aureus cell-cell interactions and biofilm formation
AUTHOR: Karaolis David K R (Reprint); Rashid Mohammed H; Chythanya Rajanna; Luo Wensheng; Hyodo Mamoru; Hayakawa Yoshihiro
AUTHOR ADDRESS: Sch MedDept Epidemiol and Prevent Med, Univ Maryland, Baltimore, MD, 21201, USA**USA
AUTHOR E-MAIL ADDRESS: karaolis@umaryland.edu
JOURNAL: Antimicrobial Agents and Chemotherapy 49 (3): p1029-1038 March 2005 2005
MEDIUM: print
ISSN: 0066-4804 _(ISSN print)
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

c-di-GMP (3'-5'-cyclic diguanylic acid) inhibits Staphylococcus aureus cell-cell interactions and biofilm formation

ABSTRACT: Staphylococcus aureus is an important pathogen of humans and animals, and antibiotic resistance is a public...
...to the scientific, medical, and agriculture communities. We recently proposed that modulating levels of the cyclic dinucleotide signaling molecule, c-di-GMP (cyclic diguanylate (3',5'-cyclic diguanylic acid), cGpGp), has utility...

DESCRIPTORS:
...ORGANISMS: Staphylococcus aureus (Micrococcaceae

CHEMICALS & BIOCHEMICALS: ...antibacterial-drug, antiinfective-drug, cyclic dinucleotide signaling molecule...

18/3,K/7 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

20533185 Genuine Article#: 586NI No. References: 49
Title: The 285 kDa Bap/RTX hybrid cell surface protein (SO4317) of Shewanella oneidensis MR-1 is a key mediator of biofilm formation
Author: Theunissen S; De Smet L; Dansercoer A; Motte B; Coenye T; Van Beeumen JJ; Devreese B; Savvides SN; Vergauwen B (REPRINT)
Author Email Address: sofie.theunissen@biontechnologies.be; lina.desmet@ugent.be; ann.dansercoer@ugent.be; bart.motte@ablynx.com; tom.coenye@ugent.be; jozef.vanbeeumen@ugent.be; bart.devreese@ugent.be; savvas.savvides@ugent.be; bjorn.vergauwen@ugent.be
Corporate Source: Univ Ghent, Lab Prot Biochem & Biomol Engn L ProBE, B-9000 Ghent//Belgium/ (REPRINT); Univ Ghent, Lab Prot Biochem & Biomol Engn L ProBE, B-9000 Ghent//Belgium/; Univ Ghent, Lab Pharmaceut Microbiol, B-9000 Ghent//Belgium/
Journal: RESEARCH IN MICROBIOLOGY, 2010, V161, N2, SI (MAR), P144-152
ISSN: 0923-2508 Publication Date: 20100300
Digital Object Identifier: 10.1016/j.resmic.2009.12.002
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
Funding: ST, TC, and BV are indebted to the Research Foundation Flanders (FWO-Vlaanderen) for financial support. We acknowledge support from the Belgian Government in the framework of the Interuniversity Attraction Pole project P6/19. We thank Jelle De Pauw for technical assistance.
Funding Organization -- Grant Number:
Research Foundation Flanders (FWO-Vlaanderen)
Belgian Government -- P6/19
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Identifiers: LARGE SECRETED PROTEIN; C-DI-GMP; ESCHERICHIA-COLI; STAPHYLOCCCCUS-AUREUS; VIBRIO-CHOLERAE; BAP; IDENTIFICATION; ADHESION; DOMAIN; BIOSYNTHESIS

18/3,K/8 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

20378651 Genuine Article#: 571JC No. References: 119
Title: Molecular mechanisms of compounds affecting bacterial biofilm formation and dispersal
Author: Landini P (REPRINT) ; Antoniani D; Burgess JG; Nijland R
Author Email Address: paolo.landini@unimi.it
Corporate Source: Univ Milan, Dept Biomol Sci & Biotechnol, Via Celoria 26/I-20133 Milan//Italy/ (REPRINT); Univ Milan, Dept Biomol Sci & Biotechnol, I-20133 Milan//Italy/; Univ Newcastle, Sch Marine Sci & Technol, Dove Marine Lab, Newcastle Upon Tyne NE30 4PZ/Tyne & Wear/England/
Journal: APPLIED MICROBIOLOGY AND BIOTECHNOLOGY, 2010, V86, N3 (APR), P 813-823
ISSN: 0175-7598 Publication Date: 20100400
Digital Object Identifier: 10.1007/s00253-010-2468-8
Publisher: SPRINGER, 233 SPRING ST, NEW YORK, NY 10013 USA
Funding: Research work in P. L.'s lab was supported by the Italian Foundation for Research on Cystic Fibrosis (project FFC# 9/2006, adopted by Gruppo Rocciatori di Belluno) and by the CHEM-PROFARMA-NET Research Program of the Italian Ministry for University and Research (Project RBPR05NWWC 004). RN was funded by a fellowship from the

European Community's Seventh Framework Programme, under grant agreement PIEF-GA-2008219592. JGB acknowledges financial support from the Natural Environment Research Council (NERC) (Awards: NER/T/S/2002/00586/2 and NE/G011206/1.)
Funding Organization -- Grant Number:
Italian Foundation for Research on Cystic Fibrosis -- FFC 9/2006
Italian Ministry for University and Research -- RBPR05NWWC -- 004
European Community -- GA-2008219592
Natural Environment Research Council (NERC) -- NER/T/S/2002/00586/2; NE/G011206/1
Language: English Document Type: REVIEW (ABSTRACT AVAILABLE)

...Descriptors: Biofilm formation and dispersal ; Quorum sensing ; c-di-GMP ; Target-directed screening ; Structure-directed screening ; Antimicrobial drugs
...Identifiers: DI-GMP; ACYLATED HOMOSERINE LACTONES; PSEUDOMONAS-AERUGINOSA PAO1; ONEIDENSIS MR-1 BIOFILMS; GENE REGULATOR AGR; STAPHYLOCCCCCUS-AUREUS; ESCHERICHIA-COLI; EXTRACELLULAR DNA; IN-VITRO

18/3,K/9 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

19906143 Genuine Article#: 519QW No. References: 27
Title: Effect of cyclic bis(3'-5')diguanylic acid and its analogs on bacterial biofilm formation
Author: Ishihara Y; Hyodo M; Hayakawa Y; Kamegaya T; Yamada K; Okamoto A; Hasegawa T; Ohta M (REPRINT)
Author Email Address: mohta@med.nagoya-u.ac.jp
Corporate Source: Grad Sch Med, Dept Bacteriol, Nagoya/Aichi/Japan/ (REPRINT) ; Grad Sch Med, Dept Bacteriol, Nagoya/Aichi/Japan/; Nagoya Univ, Grad Sch Informat Sci Human Informat, Nagoya/Aichi 4648601/Japan/; Nagoya Univ, CREST, JST, Nagoya/Aichi 4648601/Japan/; Nagoya City Univ, Grad Sch Med Sci, Dept Infect & Prevent Med, Nagoya/Aichi/Japan/
Journal: FEMS MICROBIOLOGY LETTERS, 2009, V301, N2 (DEC), P193-200
ISSN: 0378-1097 Publication Date: 20091200
Digital Object Identifier: 10.1111/j.1574-6968.2009.01825.x
Publisher: WILEY-BLACKWELL PUBLISHING, INC, COMMERCE PLACE, 350 MAIN ST, MALDEN 02148, MA USA
Funding: This work was supported by a Grant-in-Aid for Scientific Research (no. 19659110) from the Ministry of Education, Science, Sports and Culture. We thank Minoru Tanaka for his technical assistance and Yumi Sato for the chemical synthesis of cyclic-GpAp.
Funding Organization -- Grant Number:
Ministry of Education, Science, Sports and Culture -- 19659110
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Abstract: monophosphorothioic acid of cyclic-di-GMP (cyclic-GpGps) for effects on the biofilm formation of Staphylococcus aureus and Pseudomonas aeruginosa. We constructed a knockout mutant of SA0701, which is a GGDEF...
...Descriptors: biofilm ; cyclic-di-GMP ; Staphylococcus aureus ; Pseudomonas aeruginosa ; regulation of biofilm formation ; GdpS
...Identifiers: C-DI-GMP; ACETOBACTER-XYLINUM; DIGUANYLIC ACID; DOMAIN PROTEIN; CELLULOSE SYNTHESIS; TURNOVER; RECEPTOR; CYCLASE

18/3,K/10 (Item 4 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

19577643 Genuine Article#: 481QV No. References: 36
Title: c-di-GMP as a vaccine adjuvant enhances protection against systemic methicillin-resistant Staphylococcus aureus (MRSA) infection
Author: Hu DL; Narita K; Hyodo M; Hayakawa Y; Nakane A; Karaolis DKR (REPRINT)
Corporate Source: Intragen Res Inst,415 Oakington Rd/Havre De Grace//MD/21078 (REPRINT); Intragen Res Inst,Havre De Grace//MD/21078; Hirosaki Univ,Grad Sch Med, Dept Microbiol & Immunol,Hirosaki/Aomori 0368562/Japan/; Hirosaki Univ,Grad Sch Med, Inst Anim Experimentat,Hirosaki/Aomori 0368562/Japan/; Nagoya Univ,Grad Sch Informat Sci,Nagoya/Aichi 4648601/Japan/; Karagen Pharmaceut,Baltimore//MD/21210
Journal: VACCINE, 2009, V27, N35 (JUL 30), P4867-4873
ISSN: 0264-410X Publication Date: 20090730
Publisher: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, OXON, ENGLAND
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

Title: c-di-GMP as a vaccine adjuvant enhances protection against systemic methicillin-resistant Staphylococcus aureus (MRSA) infection
...Abstract: innate immune response. The protective effect of c-di-GMP as a vaccine adjuvant against Staphylococcus aureus infection was investigated by subcutaneous (s.c.) vaccination with two different S. aureus antigens...
...Descriptors: Staphylococcus aureus ; c-di-GMP ; MRSA ; Adjuvant ; Vaccine ; Immunomodulator

18/3,K/11 (Item 5 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

19369791 Genuine Article#: 460XV No. References: 51
Title: The Staphylococcus aureus GGDEF Domain-Containing Protein, GdpS, Influences Protein A Gene Expression in a Cyclic Diguanylic Acid-Independent Manner
Author: Shang F; Xue T; Sun HP; Xing L; Zhang S; Yang ZJ; Zhang LH; Sun BL (REPRINT)
Corporate Source: Univ Sci & Technol China,Hefei Natl Lab Phys Sci Microscale,Hefei 230027/Anhui/Peoples R China/ (REPRINT); Univ Sci & Technol China,Hefei Natl Lab Phys Sci Microscale,Hefei 230027/Anhui/Peoples R China/; Univ Sci & Technol China,Sch Life Sci,Hefei 230027/Anhui/Peoples R China/; Peking Univ,State Key Lab Nat & Biomimet Drugs, Sch Pharmaceut Sci,Beijing 100083//Peoples R China/
Journal: INFECTION AND IMMUNITY, 2009, V77, N7 (JUL), P2849-2856
ISSN: 0019-9567 Publication Date: 20090700
Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904 USA
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

Title: The Staphylococcus aureus GGDEF Domain-Containing Protein, GdpS, Influences Protein A Gene Expression in a Cyclic Diguanylic...
Abstract: Staphylococcus aureus is an important human pathogen that is the principal cause of a variety of...

...we identified the role of the only GGDEF domain protein (GdpS [GGDEF domain protein from Staphylococcus]) in the virulence of S. aureus NCTC8325. Inactivation of gdpS results in an alteration in...
...Identifiers: C-DI-GMP; BIOFILM FORMATION; VIRULENCE; AGR; IDENTIFICATION; AUTOLYSIS; BACTERIA; LOCUS; REGULATOR; SYSTEM

18/3,K/12 (Item 6 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

18313970 Genuine Article#: 350CT No. References: 50
Title: C-di-GMP is an effective immunomodulator and vaccine adjuvant against pneumococcal infection
Author: Ogunniyi AD; Paton JC; Kirby AC; McCullers JA; Cook J; Hyodo M; Hayakawa Y; Karaolis DKR (REPRINT)
Corporate Source: Intragen Res Inst, Havre De Grace//MD/21078 (REPRINT); Intragen Res Inst, Havre De Grace//MD/21078; Univ Adelaide, Sch Mol & Biomed Sci, Adelaide/SA 5005/Australia/; Univ York, Dept Biol, York YO10 5YW N Yorkshire/England/; St Jude Childrens Hosp, Dept Infect Dis, Memphis//TN/38104; Nagoya Univ, Grad Sch Informat Sci, Nagoya/Aichi 4648601/Japan/; Karagen Pharmaceut, Baltimore//MD/21210
Journal: VACCINE, 2008, V26, N36 (AUG 26), P4676-4685
ISSN: 0264-410X Publication Date: 20080826
Publisher: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, OXON, ENGLAND
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Descriptors: Streptococcus pneumoniae ; c-di-GMP ; immunomodulator ; adjuvant ; vaccine
...Identifiers: CYCLIC DIGUANYLIC ACID; KILLER T-CELLS; PROTEIN-A PSPA; STREPTOCCCCCUS-PNEUMONIAE; STAPHYLOCCCCCUS-AUREUS; CELLULOSE SYNTHESIS; SURFACE PROTEIN; ALVEOLAR MACROPHAGES; ACETOBACTER-XYLINUM; BACTERIAL CLEARANCE

18/3,K/13 (Item 7 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

18128728 Genuine Article#: 332VV No. References: 49
Title: A staphylococcal GGDEF domain protein regulates biofilm formation independently of cyclic dimeric GMP
Author: Holland LM; O'Donnell ST; Ryjenkov DA; Gomelsky L; Slater SR; Fey PD; Gomelsky M; O'Gara JP (REPRINT)
Corporate Source: Univ Coll Dublin, Sch Biomol & Biomed Sci, Ardmore House/Dublin 4//Ireland/ (REPRINT); Univ Coll Dublin, Sch Biomol & Biomed Sci, Dublin 4//Ireland/; Univ Wyoming, Dept Mol Biol, Laramie//WY/82071; Univ Nebraska, Med Ctr, Dept Pathol, Omaha//NE/; Univ Nebraska, Med Ctr, Dept Microbiol, Omaha//NE/; Univ Nebraska, Med Ctr, Dept Internal Med, Omaha//NE/
Journal: JOURNAL OF BACTERIOLOGY, 2008, V190, N15 (AUG), P5178-5189
ISSN: 0021-9193 Publication Date: 20080800
Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904 USA
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Abstract: synthesis. In contrast, only one conserved GGDEF domain protein, GdpS (for GGDEF domain protein from Staphylococcus), and a second protein with a highly modified GGDEF domain, GdpP, are present in the sequenced staphylococcal genomes. Here, we investigated the role of GdpS in biofilm formation in Staphylococcus epidermidis. Inactivation of gdpS impaired biofilm formation in medium supplemented with NaCl under static and...

...GGDEF domain from GdpS possessed no diguanylate cyclase activity in vitro. The gdpS gene from Staphylococcus aureus exhibited similar characteristics to its S. epidermidis ortholog, suggesting that the GdpS-mediated signal...
...Identifiers: C-DI-GMP; GRAM-POSITIVE BACTERIA; PILZ DOMAIN; ACETOBACTER-XYLINUM; DIGUANYLIC ACID; BINDING-PROTEIN;

PSEUDOMONAS-AERUGINOSA

18/3,K/14 (Item 8 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

16972289 Genuine Article#: 214LH No. References: 49
Title: Cyclic Di-GMP stimulates protective innate immunity in bacterial pneumonia
Author: Karaolis DKR (REPRINT) ; Newstead MW; Zeng XY; Hyodo M; Hayakawa Y; Bhan U; Liang H; Standiford TJ
Corporate Source: Intragen Res Inst,415 Oakington Rd/Havre Grace//MD/21078 (REPRINT); Intragen Res Inst,Havre Grace//MD/21078; Karagen Pharmaceut,Baltimore//MD/21210; Univ Michigan,Med Ctr, Dept Internal Med, Div Pulm & Crit Care Med,Ann Arbor//MI/48109; Nagoya Univ,Grad Sch Informat Sci Human Informat,Nagoya/Aichi/Japan/
Journal: INFECTION AND IMMUNITY, 2007, V75, N10 (OCT), P4942-4950
ISSN: 0019-9567 Publication Date: 20071000
Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904 USA
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Abstract: innate immunity in the lung and protects mice against bacterial invasion. We propose that the cyclic dinucleotide c-di-GMP may be used clinically as an effective immunomodulator, immune enhancer, and vaccine...
...Identifiers: KILLER T-CELLS; MURINE KLEBSIELLA-PNEUMONIA; DIGUANYLIC ACID; LEGIONELLA-PNEUMOPHILA; DENDRITIC CELLS; STAPHYLOCOCCUS -AUREUS; CELLULOSE SYNTHESIS; GAMMA-INTERFERON; ACETOBACTER-XYLINUM; PULMONARY DEFENSES

18/3,K/15 (Item 9 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

15102600 Genuine Article#: 035LC No. References: 43
Title: Organic synthesis, chemical properties, and biological activities of cyclic bis(3'-5')diguanylic acid (c-di-GMP) and its analogs
Author: Hyodo M (REPRINT) ; Hayakawa Y; Karaolis DKR
Author Email Address: hyodo m@nfo.human.nagoya-u.ac.jp; yoshi@s.nagoya-u.ac.jp; karaolis@umaryland.edu
Corporate Source: Nagoya Univ,Grad Sch Human Informat Informat Sci, CREST JST, Chikusa Ku,Nagoya/Aichi 4648601/Japan/ (REPRINT); Nagoya Univ,Grad Sch Human Informat Informat Sci, CREST JST, Chikusa Ku,Nagoya/Aichi 4648601/Japan/
Journal: JOURNAL OF SYNTHETIC ORGANIC CHEMISTRY JAPAN, 2006, V64, N4 (APR), P359-370
ISSN: 0037-9980 Publication Date: 20060400
Publisher: SOC SYNTHETIC ORGANIC CHEM JPN, CHEMISTRY HALL, 1-5 KANDA-SURUGADAI, CHIYODA-KU, TOKYO, 101, JAPAN
Language: Japanese Document Type: REVIEW (ABSTRACT AVAILABLE)

...Abstract: disclosed some novel activities of c-di-GMP, such as inhibition of biofilm formation of Staphylococcus aureus, inhibition of basal and growth factor stimulated human colon cancer cell prolifelation, and reduction of the viluence of biofilm-formed Staphylococcus aureus in a mouse model.
...Descriptors: c-di-GMP ; nucleotide ; biofilm ; phosphoramidite ; aggregation ; cancer ; MRSA

18/3,K/16 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2010 The Thomson Corp. All rts. reserv.

14958994 Genuine Article#: 024US No. References: 65
Title: Towards the identification of the common features of bacterial biofilm development
Author: Lasa I (REPRINT)
Author Email Address: ilasa@unavarra.es
Corporate Source: Univ Publ Navarra,Lab Biofilms Microbianos, Inst Agrobiotecnol,Pamplona 31006//Spain/ (REPRINT); Univ Publ Navarra,Lab Biofilms Microbianos, Inst Agrobiotecnol,Pamplona 31006//Spain/; Publ Univ Navarra,CSIC, Dept Agrarian Prod,Pamplona//Spain/
Journal: INTERNATIONAL MICROBIOLOGY, 2006, V9, N1 (MAR), P21-28
ISSN: 1139-6709 Publication Date: 20060300
Publisher: SPANISH SOCIETY MICROBIOLOGY, VITRUBIO, 8, MADRID, 28006, SPAIN
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

...Abstract: include a group Of proteins containing GGDEF/EAL domains, surface proteins homologous to Bap of Staphylococcus aureus, and some types of exopolysaccharides, such as cellulose and the poly-beta-1,6...
...Descriptors: biofilms ; PIA/PNAG ; cellulose ; c-di-GMP ; GGDEF proteins ; Bap protein
...Identifiers: CYCLIC DI-GMP; ENTEROCOCCAL SURFACE PROTEIN; STAPHYLOCOCCUS-EPIDERMIDIS; ACETOBACTER-XYLINUM; CELLULOSE SYNTHESIS; VIBRIO-CHOLERAE; AGROBACTERIUM-TUMEFACIENS; PSEUDOMONAS-AERUGINOSA; SALMONELLA-TYPHIMURIUM; INTERCELLULAR-ADHESION

18/3,K/17 (Item 1 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
(c) 2010 Elsevier B.V. All rts. reserv.

0006050638 SUPPLIER NUMBER: 2005050222
3prime,5prime-Cyclic diguanylic acid (c-di-GMP) inhibits basal and growth factor-stimulated human colon cancer cell proliferation
Karaolis D.K.R.; Cheng K.; Lipsky M; Elnabawi A.; Catalano J.; Hyodo M; Hayakawa Y.; Raufman J.-P.
AUTHOR EMAIL: karaolis@umaryland.edu
CORRESP. AUTHOR/AFFIL: Karaolis D.K.R., Dept. of Epidemiol. and Prev. Med., University of Maryland, School of Medicine, Baltimore, MD 21201, United States
CORRESP. AUTHOR EMAIL: karaolis@umaryland.edu
Journal: Biochemical and Biophysical Research Communications (Biochem. Biophys. Res. Commun.), v329, n1, (40-45), 2005, United States
PUBLICATION DATE: April 1, 2005 (20050401)
CODEN: BBRCA
ISSN: 0006-291X eISSN: 1096-7184
RECORD TYPE: Abstract; New
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
NO. OF REFERENCES: 15

The novel cyclic dinucleotide, 3prime,5prime-cyclic diguanylic acid, cGpGp (c-di-GMP), is a naturally occurring small molecule...

...GMP treatment might be a useful antimicrobial approach to attenuate the virulence and pathogenesis of Staphylococcus aureus and prevent or treat infection. In the present communication, we report that c-di...

SPECIES DESCRIPTORS:

...Staphylococcus aureus

18/3,K/18 (Item 1 from file: 72)
DIALOG(R)File 72:EMBASE
(c) 2010 Elsevier B.V. All rts. reserv.

0083616475 EMBASE/Medline No: 2010100394
Medical significance and management of staphylococcal biofilm
Agarwal A.; Singh K.P.; Jain A.
Department of Microbiology, Chhatrapati ShahuJi Maharaj Medical University, Lucknow, UP 226003, India
AUTHOR EMAIL: amita602002@yahoo.com
CORRESP. AUTHOR/AFFIL: Jain A.: Department of Microbiology, Chhatrapati ShahuJi Maharaj Medical University, Lucknow, UP 226003, India
CORRESP. AUTHOR EMAIL: amita602002@yahoo.com

FEMS Immunology and Medical Microbiology (FEMS Immunol. Med. Microbiol.) (United Kingdom) March 1, 2010, 58/2 (147-160)
CODEN: FIMIE ISSN: 0928-8244 elSSN: 1574-695X
DOI: 10.1111/j.1574-695X.2009.00601.x
DOCUMENT TYPE: Journal; Short Survey RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English
NUMBER OF REFERENCES: 138

DRUG DESCRIPTORS:
...drug therapy--dt; quinolone derivative--drug therapy--dt; quinolone derivative--pharmacology--pd; rifampicin--pharmacology--pd; Staphylococcus vaccine; telavancin--drug therapy--dt; telavancin --pharmacology--pd; tigecycline--drug therapy--dt; tigecycline --pharmacology--pd...
MEDICAL DESCRIPTORS:
*biofilm; *Staphylococcus
...prosthesis infection--etiology--et; prosthesis infection--prevention--pc ; quorum sensing; scanning electron microscopy; short survey; Staphylococcus infection--drug therapy--dt; Staphylococcus infection--prevention--pc; structure analysis; urinary catheter; urinary tract infection--etiology--et
DRUG TERMS (UNCONTROLLED): ceftibiprole--drug therapy--dt; ceftibiprole --pharmacology--pd; cyclic dinucleotide 3',5' cyclic diguanylic acid--drug administration--ad; cyclic dinucleotide 3',5' cyclic diguanylic acid--drug therapy--dt; cyclic dinucleotide 3',5' cyclic diguanylic acid--pharmacology--pd

18/3,K/19 (Item 2 from file: 72)
DIALOG(R)File 72:EMBASE
(c) 2010 Elsevier B.V. All rts. reserv.

0080696810 EMBASE/Medline No: 2005341129
3prime,5prime-cyclic diguanylic acid reduces the virulence of biofilm-forming Staphylococcus aureus strains in a mouse model of mastitis infection
Brouillette E.; Hyodo M.; Hayakawa Y.; Karaolis D.K.R.; Malouin F.
Centre d'Etude et de Valorisation de la Diversite Microbienne (CEVDM), Departement de Biologie, Universite de Sherbrooke, Sherbrooke, Que. J1K 2R1, Canada
AUTHOR EMAIL: francois.malouin@usherbrooke.ca
CORRESP. AUTHOR/AFFIL: Malouin F.: Departement de Biologie, Faculte des Sciences, Universite de Sherbrooke, 2500 Boul. Universite, Sherbrooke, Que. J1K 2R1, Canada
CORRESP. AUTHOR EMAIL: francois.malouin@usherbrooke.ca

Antimicrobial Agents and Chemotherapy (Antimicrob. Agents Chemother.) (United States) August 1, 2005, 49/8 (3109-3113)
CODEN: AMACC ISSN: 0066-4804
DOI: 10.1128/AAC.49.8.3109-3113.2005
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English
NUMBER OF REFERENCES: 32

3prime,5prime-cyclic diguanylic acid reduces the virulence of biofilm-forming Staphylococcus aureus strains in a mouse model of mastitis infection

The cyclic dinucleotide 3prime,5prime-cyclic diguanylic acid (c-di-GMP) is a naturally occurring small molecule that regulates important signaling systems in bacteria. We have recently shown that c-di-GMP inhibits Staphylococcus aureus biofilm formation in vitro and its adherence to HeLa cells. We now report that...

MEDICAL DESCRIPTORS:
*bacterial virulence; *mastitis--drug therapy--dt; *Staphylococcus aureus
ORIG. DESCRIPTORS:

18/3,K/20 (Item 3 from file: 72)
DIALOG(R)File 72:EMBASE
(c) 2010 Elsevier B.V. All rts. reserv.

0080466270 EMBASE/Medline No: 2005110426
c-di-GMP (3prime-5prime-cyclic diguanylic acid) inhibits Staphylococcus aureus cell-cell interactions and biofilm formation
Karaolis D.K.R.; Rashid M.H.; Chythanya R.; Luo W; Hyodo M; Hayakawa Y.
Dept. of Epidemiol. and Prev. Med., Univ. of Maryland School of Medicine, Baltimore, MD 21201, United States
AUTHOR EMAIL: karaolis@umaryland.edu
CORRESP. AUTHOR/AFFIL: Karaolis D.K.R.: Dept. of Epidemiol. and Prev. Med., Univ. of Maryland School of Medicine, Baltimore, MD 21201, United States
CORRESP. AUTHOR EMAIL: karaolis@umaryland.edu

Antimicrobial Agents and Chemotherapy (Antimicrob. Agents Chemother.) (United States) March 1, 2005, 49/3 (1029-1038)
CODEN: AMACC ISSN: 0066-4804
DOI: 10.1128/AAC.49.3.1029-1038.2005
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English
NUMBER OF REFERENCES: 64

c-di-GMP (3prime-5prime-cyclic diguanylic acid) inhibits Staphylococcus aureus cell-cell interactions and biofilm formation

Staphylococcus aureus is an important pathogen of humans and animals, and antibiotic resistance is a public...

...to the scientific, medical, and agriculture communities. We recently proposed that modulating levels of the cyclic dinucleotide signaling molecule, c-di-GMP (cyclic diguanylate [3prime,5prime-cyclic diguanylic acid], cGpGp), has utility...

MEDICAL DESCRIPTORS:
*biofilm; *Staphylococcus aureus
...solubility; drug stability; electrospray mass spectrometry; high performance liquid chromatography; human; human cell; methicillin resistant Staphylococcus aureus; microscopy; nonhuman; phenotype; priority

journal
ORIG. DESCRIPTORS:

18/3,K/21 (Item 1 from file: 393)
DIALOG(R)File 393:Beilstein Database - Abstracts
(c) 2008 Beilstein GmbH. All rts. reserv.

Beilstein Abstract Id: 6552279
Title: c-di-GMP (3'-5'-Cyclic Diguanylic Acid) Inhibits Staphylococcus aureus Cell-Cell Interactions and Biofilm Formation
Document Type: Journal Record Type: Abstract
Author: Karaolis, David K. R.; Rashid, Mohammed H.; Chythanya, Rajanna; Luo, Wensheng; Hyodo, Mamoru; Hayakawa, Yoshihiro
Citation: Antimicrob. Agents & Chemother. (2005) Series: 49-3, 1029 - 1038 CODEN: AMACCQ Language: English
Abstract Language: English

Title: c-di-GMP (3'-5'-Cyclic Diguanylic Acid) Inhibits Staphylococcus aureus Cell-Cell Interactions and Biofilm Formation
Abstract: Staphylococcus aureus is an important pathogen of humans and animals, and antibiotic resistance is a public...

... to the scientific, medical, and agriculture communities. We recently proposed that modulating levels of the cyclic dinucleotide signaling molecule, c-di-GMP (cyclic diguanylate 3',5'-cyclic diguanylic acid , cGpGp), has utility ...

18/3,K/22 (Item 2 from file: 393)
DIALOG(R)File 393:Beilstein Database - Abstracts
(c) 2008 Beilstein GmbH. All rts. reserv.

Beilstein Abstract Id: 6521205
Title: 3',5'-Cyclic Diguanylic Acid Reduces the Virulence of Biofilm-Forming Staphylococcus aureus Strains in a Mouse Model of Mastitis Infection
Document Type: Journal Record Type: Abstract
Author: Brouillette, Eric; Hyodo, Mamoru; Hayakawa, Yoshihiro; Karaolis, David K. R.; Malouin, Francois
Citation: Antimicrob. Agents & Chemother. (2005) Series: 49-8, 3109 - 3113 CODEN: AMACCQ Language: English
Abstract Language: English

Title: 3',5'-Cyclic Diguanylic Acid Reduces the Virulence of Biofilm-Forming Staphylococcus aureus Strains in a Mouse Model of Mastitis Infection
Abstract: The cyclic dinucleotide 3',5'-cyclic diguanylic acid (c-di-GMP) is a naturally occurring small molecule that regulates important signaling systems in bacteria. We have recently shown that c-di-GMP inhibits Staphylococcus aureus biofilm formation in vitro and its adherence to HeLa cells. We now report that...

18/3,K/23 (Item 1 from file: 399)
DIALOG(R)File 399:CA SEARCH(R)
(c) 2010 American Chemical Society. All rts. reserv.

148024432 CA: 148(2)24432t PATENT

Method for stimulating the immune, inflammatory or neuroprotective response
INVENTOR(AUTHOR): Karaolis, David K. R.
LOCATION: USA
PATENT: U.S. Pat. Appl. Publ. ; US 20070281897 A1 DATE: 20071206
APPLICATION: US 2007669006 (20070130) *US 2004PV552721 (20040315) *US 2004PV563692 (20040420) *US 200579886 (20050315)
PAGES: 60pp., Cont.-in-part of U.S. Ser. No. 79,886. CODEN: USXXCO
LANGUAGE: English
PATENT CLASSIFICATIONS:
CLASS: 514044000
IPCR/8 + Level Value Position Status Version Action Source Office:
A61K-0031/7076 A I F B 20060101 20071206 H US
A61P-0031/00 A I L B 20060101 20071206 H US
A61P-0037/00 A I L B 20060101 20071206 H US

18/3,K/24 (Item 2 from file: 399)
DIALOG(R)File 399:CA SEARCH(R)
(c) 2010 American Chemical Society. All rts. reserv.

142367640 CA: 142(20)367640h PATENT
Method for attenuating virulence of microbial pathogens and inhibiting microbial biofilm formation by using c-di-GMP and cyclic dinucleotide analogs
INVENTOR(AUTHOR): Karaolis, David K. R.
LOCATION: USA
ASSIGNEE: University of Maryland
PATENT: PCT International ; WO 200530186 A2 DATE: 20050407
APPLICATION: WO 2004US23498 (20040722) *US 2003PV490029 (20030728)
PAGES: 118 pp. CODEN: PIXXD2 LANGUAGE: English
PATENT CLASSIFICATIONS:
CLASS: A61K-031/00A
DESIGNATED COUNTRIES: AE; AG; AL; AM; AT; AU; AZ; BA; BB; BG; BR; BW; BY; BZ; CA; CH; CN; CO; CR; CU; CZ; DE; DK; DM; DZ; EC; EE; EG; ES; FI; GB; GD; GE; GH; GM; HR; HU; ID; IL; IN; IS; JP; KE; KG; KP; KR; KZ; LC; LK; LR; LS; LT; LU; LV; MA; MD; MG; MK; MN; MW; MX; MZ; NA; NI; NO; NZ; OM; PG; PH; PL; PT; RO; RU; SC; SD; SE; SG; SK; SL; SY; TJ; TM; TN; TR; TT; TZ; UA; UG; US; UZ; VC; VN; YU; ZA; ZM; ZW DESIGNATED REGIONAL: BW; GH; GM; KE; LS; MW; MZ; NA; SD; SL; SZ; TZ; UG; ZM; ZW; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM; AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; HU; IE; IT; LU; MC; NL; PL; PT; RO; SE; SI; SK; TR; BF; BJ; CF; CG; CI; CM; GA; GN; GQ; GW; ML; MR; NE; SN; TD; TG

18/3,K/25 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
(c) 2010 Elsevier Eng. Info. Inc. All rts. reserv.

0017176028 E.I. COMPENDEX No: 20062699644445
Organic synthesis, chemical properties, and biological activities of cyclic bis(3prime-5prime)diguanylic acid (c-di-GMP) and its analogs
Hyodo, Mamoru; Hayakawa, Yoshihiro; Karaolis, David K. R.:
Corresp. Author/Affil: Graduate School of Human Informatics/Information Science, CREST/JST, Nagoya University, Chikusa, Nagoya 464-8601, Japan
Corresp. Author email: hyodo m@nfo.human.nagoya-u.ac.jp
Author email: yoshi@s.nagoya-u.ac.jp; karaolis@umaryland.edu
Yuki Gosei Kagaku Kyokaishi/Journal of Synthetic Organic Chemistry (Yuki Gosei Kagaku Kyokaishi) (Japan) 2006, 64/4 (359-370)
Publication Date: 20060703
Publisher: Society of Synthetic Organic Chemistry
CODEN: YGKKA ISSN: 0037-9980
Document Type: Article; Journal Record Type: Abstract

Treatment: L; (Literature review); X; (Experimental)
Language: Japanese Summary Language: English
Number of References: 50

...disclosed some novel activities of c-di-GMP, such as inhibition of biofilm formation of Staphylococcus aureus, inhibition of basal and growth factor stimulated human colon cancer cell prolifelation, and reduction of the viluence of biofilm-formed Staphylococcus aureus in a mouse model.
Identifiers: Biological activities; C-di-GMP; MRSA; Nucleotides; Phosphoramidite
? DS

```
Set      Items   Description
S1           0   E1-E12 AND CELLULASE
S2         150   E1-E12
S3           2   S2 AND GLUCANASE
S4          82   E1-E12
S5           0   S4 AND GLUCANASE
S6        9749   BACILLUS AND (GLUCANASE OR CELLULASE)
S7           0   S6 AND LICHENIFOMIS
S8         756   S6 AND LICHENIFORMIS
S9          56   S8 AND ALKALOPHIL?
S10         37   RD (unique items)
S11         37   RD (unique items)
S12         86   E1-E12
S13          0   S12 AND CELLULASE
S14          0   S12 AND GLUCANASE
S15          0   S12 AND BACILLUS
S16        547   CYCLIC(W)DINUCLEOTIDE OR (C-DI-GMP)
S17         53   S16 AND (STAPHYLCCCCCUS)
S18         25   RD (unique items)
? S KARAOLIS, DAVID
     S19        0  KARAOLIS, DAVID
? S KARAOLIS
     S20       21  KARAOLIS
? RD

>>>Duplicate detection is not supported for File 393.

>>>Duplicate detection is not supported for File 391.

>>>Records from unsupported files will be retained in the RD set.
     S21       19  RD (unique items)
? S S21 AND (DINUCLEOTIDE)
              19  S21
          246041  DINUCLEOTIDE
     S22        1  S21 AND (DINUCLEOTIDE)
? T S22/3,K/1
>>>KWIC option is not available in file(s): 399

 22/3,K/1     (Item 1 from file: 135)
DIALOG(R)File 135:NewsRx Weekly Reports
(c) 2010 NewsRx. All rts. reserv.

0000652768      (USE FORMAT 7 OR 9 FOR FULLTEXT)
Scientists at Intragenics Research Institute describe research in bacterial pneumonia immunology
Life Science Weekly, October 16, 2007, p.1185

DOCUMENT TYPE:     Expanded Reporting  LANGUAGE: English
RECORD TYPE:       FULLTEXT
WORD COUNT:        444
```

... protective innate immunity in the lung and protects mice against bacterial invasion," wrote D.K. Karaolis and colleagues, Intragenics Research Institute. The researchers concluded: "We propose that the cyclic dinucleotide c-di-GMP may be used clinically as an effective immunomodulator, immune enhancer, and vaccine adjuvant to protect against respiratory infection and pneumonia in humans and animals." Karaolis and colleagues published their study in Infection and Immunity (Cyclic di-GMP stimulates protective innate...

...pneumonia. Infection and Immunity , 2007;75(10):4942-50). For additional information, contact D.K. Karaolis, Intragenics Research Institute, Havre de Grace, MD 21078 USA.. The publisher's contact information for...
? DS

S16	547	CYCLIC(W)DINUCLEOTIDE OR (C-DI-GMP)
S17	53	S16 AND (STAPHYLOCCCCCUS)
S18	25	RD (unique items)
S19	0	KARAOLIS, DAVID
S20	21	KARAOLIS
S21	19	RD (unique items)
S22	1	S21 AND (DINUCLEOTIDE